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10/039,125	12/31/2001	Ramkrishna Prakash	200304386-1	1059

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EXAMINER

NGUYEN, HAI V

ART UNIT	PAPER NUMBER
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2142

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/039,125

Applicant(s)

PRAKASH ET AL.

Examiner

Hai V. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5,7-17,19 and 22-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-17,19 and 22-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This Office Action is in response to the communication received on 22 July 2005.
2. Claims 6, 18, 20-21 are cancelled.
3. Claims 24-31 are new.
4. Claims 1-5, 7-17, 19, 22-31 are presented for examination.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by **Hu et al.**  
**U.S patent # 6,535,518 B1.**

7. As to claim 1, Hu discloses a server network comprising: a plurality of cluster nodes connected via a SAN according a SAN-based protocol (*Hu, various physical interfaces like multiple network interface or storage interfaces or multiple servers, col. 8, lines 8-17*); and at least first and second router nodes (*Hu, Fig. 8, items 130, 110; Fig. 9, items 220, 250*) bridging the plurality of cluster nodes (*Hu, Fig. 8, items SAN 110 or SAN 121*) to a LAN (*Fig. 8, network item 130*) (*Fig. 9, col. 7, line 15 – col. 8, line 25,*

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*decoding/control/routing block (CU) 205 in the router bridging SAN interface and LAN interface).*

8. As to claim 2, Hu discloses, wherein the router node is connected to the LAN via a LAN-based protocol (*Figs. 1, 9, item 220*).

9. As to claim 3, Hu discloses, wherein the LAN-based protocol is TCP/IP (*Figs. 1, 9*).

10. As to claim 4, Hu discloses, wherein the router nodes are connected to the plurality of cluster nodes via the SAN according to the SAN-based protocol (*Fig. 1; col. 8, lines 8-17; Fig. 8, item 110; Fig. 9, item 250*).

11. As to claim 5, Hu discloses, wherein the SAN-based protocol is one of INFINIBAND, Next Generation I/O (NGIO), and Future I/O (FIO) (*Fig. 1; col. 8, lines 8-17*).

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 7-17, 19, 22-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hu** as applied to claims 1-5 above, and further in view of **DeKoning** U.S patent #: **6,757,753 B1**.

14. As to claim 7 Hu does not explicitly disclose wherein the second router node bridges to the plurality of cluster nodes after the first router fails-over to the second

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router node. Thus, the artisan would have been motivated to look into the related networking arts for potential methods and apparatus for implementing the second node to bridge the plurality of cluster nodes after the first router fails-over to the second router node.

In the same field of endeavor, DeKoning, related Uniform Routing Of Storage Request Through Redundant Array Controllers, discloses (e.g. network resource backup) that *the RAID storage devices 134 may interact with other storage-related devices and systems, such as a backup system 156 and a remote data facility 158 which maintains a copy of the data from some or all of the logical volumes 122 (DeKoning, col. 5, line 45 - col. 6, line 3; col. 7, lines 25-44).*

Accordingly, it would have been obvious to one of ordinary skill in the networking art at the time the invention was made to have incorporated DeKoning's teachings of a second system (DeKoning, Abstract, col. 5, line 45 - col. 6, line 3; col. 7, lines 25-44) with the teachings of Hu, for the *purpose of preventing the catastrophic failure of the data storage system and maintaining a mirror copy of the data (DeKoning, col. 5, line 45 - col. 6, line 3; col. 7, lines 25-44).*

15. As to claim 8, Hu-DeKoning discloses, wherein the first and second router nodes bridges to the plurality of cluster nodes in parallel (*DeKoning, col. 5, line 45 - col. 6, line 3; col. 7, lines 25-44).*

16. As to claim 9, Hu-DeKoning discloses, wherein the router node comprises a session management agent for maintaining session information for sessions between the router node and a cluster node of the plurality of cluster nodes (*Hu, Figs. 8-10, the*

*router keeps a routing table, switching status, and history and contain statistics, and controls the path traversed by the packets. The content in the routing table is provided by the server, based on storage controller (or SAN interface) and/or decoded packet information, cols. 7-8).*

17. As to claim 10, Hu-DeKoning discloses, wherein the router node comprises a policy management agent for maintaining connection information and routing policies for the plurality of cluster nodes (*Hu, Figs. 8-10, the router keeps a routing table, switching status, and history and contain statistics, and controls the path traversed by the packets. The content in the routing table is provided by the server, based on storage controller (or SAN interface) and/or decoded packet information, cols. 7-8).*

18. As to claim 11, Hu-DeKoning discloses, wherein the router node comprises a routing agent for maintaining connection information for the plurality of cluster nodes (*Hu, Figs. 8-10, the router keeps a routing table, switching status, and history and contain statistics, and controls the path traversed by the packets. The content in the routing table is provided by the server, based on storage controller (or SAN interface) and/or decoded packet information, cols. 7-8).*

19. As to claim 12, Hu-DeKoning discloses, wherein the router node comprises a filter agent for bi-directional conversion between the SAN based protocol and a LAN based protocol (*Hu, Figs. 8-10, the router keeps a routing table, switching status, and history and contain statistics, and controls the path traversed by the packets. The content in the routing table is provided by the server, based on storage controller (or*

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*SAN interface) and/or decoded packet information, cols. 7-8; the device is bi-directional, col. 9, lines 25-46)).*

20. As to claim 13, Hu-DeKoning discloses, a server network comprising: a plurality of cluster nodes connected via a SAN according a SAN-based protocol (*Hu, various physical interfaces like multiple network interfaces or storage interfaces or multiple servers, col. 8, lines 8-17*); and at least first and second router nodes (*Hu, Fig. 9, items 211, 215*) bridging the plurality of cluster nodes (*Hu, Fig. 8, items SAN 110 or SAN 121*) to a LAN (*Fig. 8, item 130*) (*Fig. 9, col. 7, line 15 – col. 8, line 25, decoding/ control/ routing block (CU) 205 in the router bridging SAN interface and LAN interface*), wherein at least one cluster node comprises a management node (*Figs. 1, 9, the server manages, sets the routing tables and acts as supervisor, col. 7, lines 1-55, col. 9, lines 56-63*) for setting routing policies (*Hu, routing settings*) on the router node.

21. As to claim 14, Hu-DeKoning discloses, wherein the management node comprises a monitoring agent for obtaining statistics from the router node (*Hu, Figs. 8-10, the router keeps a routing table, switching status, and history and contain statistics, and controls the path traversed by the packets. The content in the routing table is provided by the server, based on storage controller (or SAN interface) and/or decoded packet information, cols. 7-8*).

22. As to claim 15, Hu-DeKoning discloses, wherein a cluster node of the plurality of cluster nodes comprises a session management agent for holding session information (*Hu, Figs. 8-10, the router keeps a routing table, switching status, and history and contain statistics, and controls the path traversed by the packets. The content in the*

*routing table is provided by the server, based on storage controller (or SAN interface) and/or decoded packet information, cols. 7-8).*

23. As to claim 16, Hu-DeKoning discloses, wherein a cluster node comprises a policy management agent for maintaining routing policies for the plurality of cluster nodes (*Hu, QoS requirements and measurements, the server maintains the routing settings, col. 7, lines 3-55).*

24. As to claim 17, Hu-DeKoning discloses a method of bridging a remote LAN client and plural SAN cluster nodes, comprising the steps of:

receiving a request to establish a connection from the remote LAN client (*Fig. 10, col. 5, line 26 – col. 6, line 58; col. 8, lines 26 – col. 9, line 24*);

in response to the received request, accessing information that maps service types (*Hu, types of traffic like HTTP, PTP, RTP and etc., col. 5, line 26 – col. 6, line 58; col. 10, lines 59-65*) to respective SAN cluster nodes (*Fig. 10, col. 8, lines 26 – col. 9, line 24*);

based on a service type specified by the received request and based on accessing the information, selecting one of the plurality SAN cluster nodes (*Fig. 10, col. 5, line 26 – col. 6, line 58; col. 8, lines 26 – col. 9, line 24*);

receiving a LAN protocol communication from the remote LAN client (*Hu, Figs. 8-9, Network interface 220 receiving incoming packets; col. 5, line 26 – col. 6, line 58; col. 8, lines 26 – col. 9, line 24*);

transforming the LAN protocol communication into a SAN protocol communication (*Hu, Figs. 8-10, Conversion 221 and Switching 201, Fig. 10, Switching*



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303, converting the incoming packet protocol into SAN Interface 250, col. 8, lines 26 – col. 9, line 24; DeKoning, Fig. 3, col. 8, lines 4-16); and

sending the SAN protocol communication to the selected one of the SAN cluster nodes (Hu, Figs. 8-9, then Conversion 221 and Switching 201, Fig. 10, Switching 303, sending the incoming packet to SAN Interface 250, col. 8, lines 26 – col. 9, line 24; col. 10, lines 30-65).

25. As to claim 19, Hu-DeKoning discloses, maintaining statistical information for the SAN cluster node (Hu, Fig. 10; the router keeps a routing table, switching status, and history and certain statistics, and control the path traversed by the packets (col. 7, lines 2-55)).

26. As to claim 22, Hu-DeKoning discloses a router comprising:

a session management agent to maintain session information for sessions with a plurality of cluster nodes over a LAN (Hu, the router keeps a routing table, switching status, and history and certain statistics, and control the path traversed by the packets (col. 7, lines 2-55));

a routing agent to maintain connection information for the plurality of cluster nodes connected via a SAN according to a SAN-based protocol, wherein the connection information maps service types to respective cluster nodes, (Hu, Figs. 8-10, the router keeps a routing table, switching status, and history and contain statistics, and controls the path traversed by the packets. The content in the routing table is provided by the server, based on storage controller (or SAN interface) and/or decoded packet information, cols. 7-8);

the routing agent to receive a service request that specified a service type (*traffic types or nature of applications, for example, HTTP, FTP, etc., col. 5, line 26 – col. 6, line 58*), and the routing agent to select one of the cluster nodes based on the specified service type and the connection information (*Hu, the decoded header information (IP address, port ID, sequence number, etc.) is used as an index to the routing table for a match. A match entry means the direct connection between network and storage has been authorized, col. 5, lines 50-61; col. 7, line 2 – col. 8, line 67*); and

a filter agent to convert between the SAN-based protocol and a LAN-based protocol (*Hu, Figs. 8-10, 205 decoding/ control/ routing the communication protocol buffer 211 and through network interface 220; cols. 7-8; DeKoning, Fig. 3, col. 8, lines 4-16*).

27. As to claim 23, Hu-DeKoning discloses, a policy management agent to maintain routing policies (*Hu, routing settings, QoS requirements and measurements*) for the plurality of cluster nodes (*Hu, the router keeps a routing table, switching status, and history and certain statistics, and control the path traversed by the packets (col. 7, lines 2-55)*).

28. As to claim 24, Hu-DeKoning discloses, wherein the connection information comprises a policy table (*Hu, the decoded header information (IP address, port ID, sequence number, etc.) is used as an index to the routing table for match. A match entry means the direct connection between network and storage has been authorized, col. 5, lines 26-67*).

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29. As to claim 25, Hu-DeKoning discloses, wherein the SAN-based protocol is different from the LAN-protocol (*Hu, the TCI/IP protocol conversion is carried out on the device (321 and 320), col. 8, lines 30-67*).

30. As to claim 26, Hu-DeKoning discloses, wherein the connection information further comprises information to indicate authentications to be performed for respective service types (*Hu, the decoded header information (IP address, port ID, sequence number, etc.) is used as an index to the routing table for match. A match entry means the direct connection between network and storage has been authorized, col. 5, lines 26-67; a routing table match indicates an established (authorized) connection, col. 8, lines 30-67*).

31. As to claim 27, Hu-DeKoning discloses, wherein the connection information further comprises weighting factor information to indicate a proportion of service requests to be directed to a respective cluster node for a particular service type (*Hu, traffic types (1) and (2) will be routed to respective network or storage interfaces (e.g., from storage to network or vice-versa.) while (3) and (4) will be sent to server(s). The decoding process is to look into necessary protocol (layers) and to categorize incoming traffic (from where and for what), (col. 5, lines 40-67)*).

### ***Claim Rejections - 35 USC § 103***

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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33. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hu-DeKoning as applied to claims 1-27 above, and further in view of Dobberpuhl et al. U.S. patent # 6,754,718 B1.

34. As to claim 28, Hu-DeKoning does not explicitly disclose, wherein the cluster nodes connected via the SAN are viewed by a remote client as being assigned a single IP address. It would have been obvious to one of ordinary skill in the networking art to conclude that remotely viewing the SAN nodes connection from a remote client assigned a single IP address is well-known in the networking art, as evidenced in Figures 1, 3, item 130, col. 3, lines 15-29, in Dobberpuhl et al.

35. Claim 29 is similar limitation of claim 25; therefore, it is rejected under the same rationale as in claim 25.

36. As to claim 30, Hu-DeKoning discloses, wherein each router node stores sessions information to route data from remote LAN-clients to the cluster nodes.

37. Claim 31 corresponds to the method of claim 17; therefore, it is rejected under the same rationale as in claim 17.

38. Further references of interest are cited on Form PTO-892, which is an attachment to this action.

### ***Response to Arguments***

39. Applicant's arguments filed on 22 July 2005 have been fully considered but they are not persuasive.

40. In the remark, Applicant argued in substance that:

Point (A), the prior art do not disclose that, "the first and second router nodes bridging SAN cluster nodes to a LAN" in claim 1.

As to point (A), Hu discloses in Fig. 9 nodes 220, 250, that these nodes bridge the SAN network through the SAN interface 250 to the network through the network interface 220.

Point (B), the prior art do not disclose that, "the management node for setting routing policies on the router node" in claim 13.

As to point (B), Hi discloses that, "a management node (*Figs. 1, 9, the server manages, sets the routing tables and acts as supervisor, col. 7, lines 1-55, col. 9, lines 56-63*) for setting routing policies (*Hu, routing settings*) on the router node. The software on the server will communicate with the device for all necessary setup (e.g., routing table and file system for the storage) through the Router Control (316) and Scheduler (315) and then pass the control to the device and notify the storage to start a response to the request with a given file ID (or name) to fetch the data. When the response to data in html format comes back from the storage, it will be correlated to an established connection in the BRT (315) for proper path (314) (col. 8, lines 30-67)."

Point (C), the prior art do not disclose that, "accessing information that maps service types to respective SAN cluster nodes, and based on a service type specified by

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a received request and based on accessing the information, selecting one of the plural SAN cluster nodes” in claim 17.

As to point (C), Hu discloses that, “traffic types (1) and (2) will be routed to respective network or storage interfaces (e.g., from storage to network or vice-versa) while (3) and (4) will be sent to server(s). The decoding process is to look into necessary protocol (layers) and to categorize incoming traffic (from where and for what). Then the decoded header information (IP address, port ID, sequence number, etc.) is used as an index to the routing table for a match. A match entry means the direct connection between network and storage has been authorized, col. 5, lines 40-67; col. 7, line 2 – col. 8, line 67)”.

### ***Conclusion***

41. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai V. Nguyen whose telephone number is 571-272-3901. The examiner can normally be reached on 6:00-3:30 Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on 571-272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hai V. Nguyen  
Examiner  
Art Unit 2142



THONG VU  
Primary Examiner  
